AMERICAN FARMER.

RURAL ECONOMY, INTERNAL IMPROVEMENTS, PRICE CURRENT.

" *O fortunatos nimium sua si bona norint*
" *Agricolas.*" . . . . VIRG.

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AGRICULTURE.

An Address delivered before the Massachusetts Agricultural Society at the Brighton Cattle Show, October 17th, 1820.—By R. Sullivan.

An eminent writer has said that *a farmer may be crushed by the weight of his own riches.* The meaning of the author is exemplified, in the disproportion of so many of our farms to the capital of the cultivator and to the number of his labourers. In surveying the agricultural districts of our commonwealth, we look in vain for the evidence of that intelligence and enterprise which the world has been willing to ascribe to the character of New England men. Those of our countrymen, who are engaged in other pursuits, appear to have a higher claim to the distinction which these qualities bestow. Not that farmers are a meaner race of men, or that they are incapable of as great efforts as other classes of our citizens. But they have chosen to display the energy of their character in every thing rather than in the appropriate labours of husbandry. And when we are heard to boast of the intelligence of the community of farmers in Massachusetts, we are not to be understood, and we say it with regret, as speaking of their proficiency in their professional art. They appear to shrink with diffidence from the task of a scientific and thorough cultivation.

The disproportionate size of our farms is an hereditary evil. And the errors and prejudices which have accompanied it, for several generations, are deep rooted. The injurious influence of these reaches to the leading and most obvious principles of good husbandry. How many of our farmers, to obtain a greater produce, prefer to extend their imperfect cultivation to a large surface rather than to cultivate a less surface well! In the former case less skill is required, and less perfection in the implements. How few think it important whether their kine be of an improved or of an ordinary breed! With their extensive pastures, it is thought, the dairy may be as cheaply supplied from a greater number of indifferent animals as from a smaller number of a better quality. Then, at the close of the season, the cattle are sometimes left to subsist on the old fog of the ample fields until the snow falls, and occasionally browse in the woods. When the storms of winter have driven the cattle to the fold, the numerous herd are put on a stinted allowance—not always of English hay nor of roots. In some instances the farmer will have accomplished his aim if the cattle survive the winter. Not to go more into detail—it is apparent, that as his husbandry is defective in its great principle, it must be defective throughout. His opinions and practice are derived from his ancestors. His own habits have given to them additional force. He may then unaffectedly wonder, that other methods should be thought preferable to those to which he is accustomed—and listen with indifference and distrust, to statements, which demonstratively shew, that his practices are erroneous and against his true interests. He may be an eye witness of the results of a neighbour's better directed labours—notice the richer products of his improved soil—his finer breed of animals—and be led by his curiosity to examine the various implements employed by the scientific cultivator, and go away with the belief, that a plain and prudent farmer has nothing to learn, but should steadily pursue the beaten track of his ancestors. Should his better reason suggest the probable utility of a new experiment, the momentary impulse towards innovation is checked by rising fears. The disadvantages of his present condition, whatever th y may be, have become familiar and are easily borne. The humblest of our species oppressed daily by the miseries of penury, may have the same consolation. There is no species of slavery worse than that which men impose upon themselves in yielding wholly to the guidance of custom and the narrow prejudices which it engenders.

It is a fundamental principle of good and profitable husbandry, that no more land should be laid out for cultivation than the farmer can till in the most skilful and thorough manner. Wherever there is a crowded population, the husbandman may be compelled to seek his subsistence within the limits of a few acres. The resources of art, which he must call to his aid, are alike open to all whether they possess more or less land—and whether they inhabit districts more or less populous—nor are these resources less valuable in the one case than the other; so far as respects the general treatment of the soil, and the great object of increasing its productiveness. If five acres under faithful management can be made to yield a subsistence for a family, shall we be permitted to say that a hundred of equal quality can do no more? If it be said that a refined and thorough cultivation involves an expense which absorbs the profit, let it be remembered, that the skilful farmer often not only obtains a comfortable support from the produce of a few acres, but is enabled from the surplus of his earnings to add progessively to his little territory, and to become opulent. It may be objected, that a result like this cannot be expected without a preparatory acquisition of science—without much care and much reflection in the choice of means. But on what other terms is success to be expected in any other calling or pursuit? It is no answer to say, that the common operations of a rude husbandry are laborious, and that the farmer only adds to his burdens by permitting his attention to be occupied by whatever is new, that comes recommended as an improvement—he will learn how to make the same labour more productive—he will have the benefit of the experience of the most enlightened and wisest practical men, who cannot be supposed to have toiled in vain in their endeavours to improve the art of husbandry—nor to have had any other aim than to ascertain the means of procuring the greatest profit from their labour.

Farmers are over cautious in admitting innovations on their practice, and discover too much of a jealous reluctance to examine the documents by which the utility of these may be fully proved. No one doubts, that all the arts which contribute to the support and comfort of man in civilized life, have had their origin at different periods, and that at first they were not as perfect as we now find them, but that they have advanced step by step, through progressive stages.—Nor will it be questioned that improvements now known to be valuable, have sometimes been long prepared and tendered to the acceptance of mankind before their merit has been admitted. Their authors may have perished with the reputation of visionary men—an ill-merited reputation, as unpropitious to the interests of society, as unjust to the individuals.

Who, looking back on the past, will hesitate to agree, that our posterity, will gather from the same fields five fold more than the present generation? And how is this to be accomplished; by what means? If we look to Europe; to England especially; we find there the necessary means in use. It is to be effected, not so much by an increase of labour, as by a more judicious application of it, with the aid of improved implements. In whatever respects the husbandry of England is preferable to that of our own country—and there can be no doubt it is so in many—some future generation of our people, perhaps wiser than the present, will assuredly adopt these profitable methods of the English farmer. Why then should we now reject them? The reason in favour of receiving them at a future period by our posterity will be no other than may be urged for the adoption of them now—it is—that they are the result of careful and repeated experiment, and that their utility is established.

We are a highly privileged people, in as much as with all the rich resources of a new country, we may avail ourselves of the science and experience of the old world. Our yeomanry are proprietors of estates, which, under skilful management, would entitle them to rank with the wealthy in some parts of Europe. We enjoy a free intercourse with every portion of the world, whence any useful knowledge may be derived—and our husbandmen have not only capacity to judge, but opportunity to gain, whatever any other country can now offer to give variety to our culture, or improvement to our husbandry.

Considerations like these ought to check all unreasonable distrust of what is new. They furnish sufficient reason for keeping the mind open to conviction—and for training it to a habit of liberal inquiry. There is no question here of the truth of abstract speculations. But only how far, what has been found profitable to the inhabitants of other countries by experiment and long use, may be beneficial to us.

A reference to the history of agriculture in the land of our progenitors, will shew, that, as much as the farmers of that country now excel us in the art, at a period so late as that of the first settlement of the English in this country, our common roots and fruits were not cultivated in England—a small portion only of the land had been subjected to tillage—numerous herds and flocks overran the territory—and almost the whole country presented nothing to the view but an alternation of pasture and forest. A Baron of the realm, at the period alluded to, enjoyed fewer of the substantial comforts of life than a reputable farmer of the present day. Consider for a moment the advantage, which a knowledge of the potato, and the modern method of cultivating it, gives to the farmer of our times over a person in the same class in the reign of Henry the Eighth, of England. The produce of one acre of this root, carefully cultivated, will sustain, for the space of a year, ten persons. It would require but one faithful labourer to manage with proper care ten acres with a crop of the potato. Thus by his labour alone a hundred persons might be supplied with a sufficiency of food for the time mentioned.

If a half century ago it had been said that there remained to be known nothing which could be turned to profitable use in agriculture, there is no one here present that could not bear testimony to the absurdity of the assertion; nor would hesitate to say, that it was presumptuous, and against reason. Would it not be as absurd to speak thus of the future? Science is continually engaged in enriching this art. Commerce is even furnishing new materials for experiment; it not only transports the products of one country to another, for consumption, but for propagation. It not only brings us from abroad vegetable productions before unknown, but the knowledge of their uses, and the methods of their cultivation.

For what, let me ask, are our times more distinguished, than for the zeal and success with which all science is applied to practical uses? The chemist the mineralogist, the botanist and the mathametician are fellow labourers with the practical farmer and the manufacturer. Vain and unprofitable theories no longer engross the attention of men of science. It can no longer be said, as formerly, that an active and feverish imagination is as distinguishing a mark of a philosopher as of a poet. Philosophers are, in our days, *business men.*

There are in almost all parts of Europe associations of distinguished persons, united not only for the purpose of encouraging the researches and rewarding the useful discoveries of genius, but for ushering such discoveries into the world under the sanction of their patronage, and for inviting and encouraging the public to avail of them. Societies for the same purposes, not inconsiderable in number, exist also in our own country.

Cultivators of the soil may confidently anticipate an enlargement of their resources, not only by the rapid improvement of the art, but by the multiplication of their products. New staples will find their way into New England, as they have done, from time to time, elsewhere. Cotton, the great staple of the south, now worth forty millions a year to the United States, was not a native of the country. The grape, which yields the great staple of France, was not indigenous, nor was the olive in the south of Europe. Massachusetts, within a few years, has acquired an invaluable stock, in the Merino sheep. To those who know their intrinsic worth, it will not be thought presumptuous to say, that they will ere long yield us our most valuable staple. Whether we consider the abundance, the fineness, or the beauty of their fleece, they are, in all these respects, a gain to our country. The history of the prevailing prejudice against the animal, were it not too delicate a subject to touch upon, is too recent not to be generally known. The remembrance of the Merino *mania* will soon cease to bring up painful associations, and we shall be better disposed to believe, what is demonstrably true, that we are indebted to Spain for a great source of future wealth. After the *tulipo-mania*, or rage for tulips, had subsisted three years in Holland, from 1634, during which, it took entire possession of that sober people the Dutch, and engrossed in a single town a capital of four and a half millions of dollars, it subsided, and left the tulip to be, as it has ever since continued, the favorite flower of the Hollander. And may we not hope that the Merino sheep, possessing *so much more substantial merit*, will ere long become a universal favourite in Massachusetts?

Discoveries and inventions, the use and benefit of which are familiar, are not always duly valued, because we are not always aware how different would be our condition without them—would we bring distinctly to view, a state of society less improved than that of our own day, and the inconveniences attendant upon a less advanced stage of the useful arts, we should be more inclined to look forward with interest upon every prospect of new acquisitions to our stock of knowledge and means of enjoyment. We have seen how important a rank the modern farmer of England with his skill and resources would have held in the estimation of his countrymen, who had preceded him from two to three centuries. We must not forget that he deserves also to be considered as in advance of the husbandman of our own country. Were it not so, how could he subsist and support the heavy burdens, which the peculiar circumstances of his country have imposed upon him? Not less than half his income is absorbed by taxes—the great extension of the manufactures oblige him to pay dear for labour, and the average prices of the provision markets are not so great as those of our own. Under all these disadvantages he maintains his independence. He is enabled to do so by adopting improved labour-saving implements—by forcing the soil to its full capacity of bearing—by assiduous attention to the accumulating of manures—by proper measures to prevent their waste—and by a judicious application of them—by raising root crops, on an extensive scale, for his cattle—and by an admirable system of order, economy, and neatness, in every branch of husbandry.

In no country of Europe, we have said, are the same class of cultivators so amply endowed with lands as the husbandmen of Massachusetts. The burdens of our government are so light, that they are scarcely more felt than the weight of the atmosphere. The four millions of acres in Massachusetts would sustain a population from a million to a million and a half—and just in proportion as our products increase, there will rise up mouths to consume them.

Were the labours of the cultivators, or the large farms in Massachusetts, confined to such portions of land as their means would enable them to husband in a skilful and faithful manner, there can be no doubt that one third part of the land now employed in tillage would yield as great products as are obtained from the whole. It will be perceived that the farmer may thus increase the value of his farm three fold. The story of a Swiss farmer to the same point, although it may be thought more properly to belong to the pages of the Almanack, than to a discourse on an occasion like the present, I may be allowed to state in substance, as affording a good practical lesson. The person alluded to had portioned in succession three daughters, with a quarter part of his farm to each. As his territory thus diminished, he redoubled his efforts and employed additional art and care in his cultivation, and thus kept up his crops to the same aggregate amount each year, even when there remained to him only a fourth part of the land which he originally possessed.

As an agricultural community, our progress in improvement cannot be great until the science of breeding and the art of keeping cattle is better understood; until we attach a broader signification to the word *manure*—that great aliment of agriculture, extending it so as to embrace a composition of earths and every species of vegetable refuse and animal offal, as well as the litter and dung of the stable—nor until ploughs and other implements are adopted superior to those now commonly used. It has been ascertained by an accurate instrument adapted to the purpose, that there is a difference in ploughs of the same size and weight, in regard to the power required for the draft, amounting to from *two to six hundred per cent.* It is doubted whether the knowledge of such a difference, or indeed of any, is known generally to our husbandmen or whether it has usually been considered in the purchase of the implement. Every farmer complains of the expense of labour. This discovery will enable him to dispense with half or perhaps two thirds of his team in one of the most laborious operations of the farm. It will not be out of place here to state, that in one of the northern counties of England, it had been the universal practice to plough with six horses, until, on the institution of a periodical ploughing match, the old ploughs were in a short time laid aside, and new ones on an improved construction substituted. It was soon found that two horses could accomplish the same work which with the ploughs before in use, it had required six horses to perform. How important is such a discovery to the farming interest!

(To be continued.)

A New Theory of Agriculture, in which the nature of Soils, Crops and Manures is explained; many prevailing prejudices are exploded. And the application of Bones, Gypsum, Lime, Chalk, &c. Is determined on scientific principles, by W. GRISENTHWAITE.

CHAPTER I.

Introduction. Origin of Agriculture. Its progress. Necessity of fixed principles. The want of them a great cause of the present imperfect state of Agriculture. On germination.

In the infancy of society, as in the infancy of man, knowledge of every kind is almost entirely and necessarily restricted to particulars. It is after long and repeated observation; after careful and accurate comparisons only, that the mind is led to generalize facts: and to classify, and systematize those general facts, is the highest species of exertion of which the human intellect is capable. By the multiplication and extension of these systems, the progress of civilization may every where be accurately marked: the advance of manners, and the arts being simultaneous with that of philosophy. And that period of human existence may be pronounced the most perfect, when the speculations, and conclusions of philosophy are carried from the closets of the learned to explain, and improve the practical œconomy of civil life. The gradations here noticed are made with remarkable slowness. Long intervals elapse before observation is succeeded by philosophical reflection, and a still longer time intervenes before the deductions of phylosophy become the guides of mechanical exertion. These truths are no where more strikingly exemplified than in the progress of Agricultural knowledge. At first, supplied by the bounty of nature, man contentedly gathered what was spontaneously produced; he ate of the fruits of the field with the same incurious satisfaction that he drank of the rivers that ran through them. Experience, however, would soon teach him that such supply was precarious; that heaven had furnished him with muscular powers not only calculated, but evidently designed, for habits of industry; that the good things of this life were to be the rewards of exertion: he would discover, that though nature had done much, yet she had left much to do: and instead of finding all her operations succeeded by unchanging results, he would witness vicissitudes which interfered with his comforts, and failures which sometimes might threaten his existence: in fine, she would have seemed to have scattered the means of rescuing those operations from contingency, for the particular purpose of giving him employment in their recollection. In the prosecution of this employment he would feel himself interested in the processes of vegetation—in removing obstructions, and providing auxiliaries; these would stimulate research, which in this, as in all other cases, where principles are first investigated, accident would supply knowledge which reason could not confer—but knowledge so acquired would be extremely limited, it would just reach the boundaries of his wants—an increase of which would impel him to fresh observation, and consequently to fresh knowledge. Thus agriculture originated, and thus it advanced: even at the present day it consists of operations little understood in principle, and processes adopted from no better authority than traditionary sanction: tradition that furnishes general precepts where particular instructions are required; that tells what is to be done every where, and on every occasion, which can be done in a few places only, and for singular purposes, with any prospect of success.

What has been thus transmitted to us imperfect, it becomes us to endeavour to complete—and we may derive consolation in the attempt from the consideration, that those operations and processes, so far as they depend on nature, are subject to immutable laws—and to investigate immutable laws, to trace back constant effects to unchanging causes, and to observe the gradual formation of organized matter, are pursuits really delightful because they are rational—interesting because they furnish fresh proofs of intelligent, beneficent design, to enlarge the scheme of piety; and useful, because they afford practical knowledge to improve the condition of man. It is the last consideration that is most

important at the present moment. The immense increase in the population of this country, and the certainty that all other countries are rising rapidly to the same condition, render it necessary that every exertion should be made to improve the productiveness of the soil; to obviate the liability to failure; and, consequently, to make the supply as certain as the demand is constant. This can be effected in no other way than that of conducting the business of agriculture upon fixed principles, for when men, unaided by such a guide, allow the success of the future to depend solely on the experience of the past, such success will be precarious, and disappointment will be frequent. A thousand contingences may interpose to baffle industry, and defeat hope. These will arise out of the disturbing causes which incidentally accompany every operation of nature. To be secure, the operation must be well understood.

As I have mentioned the immutability of the laws of nature, as an encouragement to promote the investigation of physical phænomena, so it may be necessary to explain, in this place, how far our investigations can extend, and what are the limits beyond which they cannot pass. Every attempt that has hitherto been made to discover first causes, has ended in disappointment—the first springs of action, the primum mobile of nature, are inscrutable to human sense; and imagination speculates in vain when unassisted by observation—happily for man his well being here is independent of such knowledge. It is sufficient for him to know that the materials of this globe, which he inhabits, will act upon each other in a particular manner under particular circumstances: the manner and the circumstances are the considerations with which it is more immediately important for him to become acquainted.

In tracing the progress of vegetation from the germination of the seed to the expansion of the flower, and in examining the several substances formed during the period of growth, it will not be necessary to consider, whether vitality possesses laws peculiar to itself, or modifies those laws to which inert matter is subject: these are questions that may afford much interest to the physiologist, but are not essential to the practical farmer. To know that particular plants do generate particular substances, and that the materials from which those substances are to be generated, must be presented to the plant in a particular manner, is all that is required for the business of agriculture.

Some writers on this subject have contended for the inutility of knowing how manures promote the growth of vegetables, as if the knowledge of an operation could contribute nothing to the successful management of it; and yet in every other art such a knowledge is ardently desired, and sedulously cultivated. In agriculture they are contented to admit that manures assist vegetation, and neither trouble themselves to ascertain what they understand by vegetables, or manures. The vulgar notion is, that every kind of refuse matter is manure, and that the growth of all vegetables is promoted by it. In the course of this essay I shall endeavour to prove the absurdity of such a notion, and point out the impediments it has thrown in the way of agricultural improvement.

Having shown that agriculture originated in the necessity of man, that its progress has been indebted to the same cause as its origin, and that its present state is highly imperfect, I shall proceed to consider the subject of vegetation from the incipient changes which take place in the seed during germination, to the completion of fructification, and the reproduction of a new seed; in the course of which consideration much important variety of matter will become developed, that will at once be interesting to the speculative enquirer, and useful to the operative agriculturist.

A seed, if kept in a situation free from moisture will undergo no change whatever—perfectly dry air being incapable of producing any action among its constituents, or of forming any combination with them. Moisture is not only one of the great media through which chemical changes are effected, but is also that which facilitates, and perhaps, is equally indispensible in the operation of vegetation. There are also recorded many facts which seem to justify the conclusion, that a seed exposed to moisture, and secluded from air, will remain many years, and probably generations, without alteration, they having been found in situations in the earth where it is almost certain they must have laid for several centuries. Seeds which have been discovered under these circumstances have lost nothing of their original properties, nor are they less disposed to germination than other seeds, when placed in situations favourable to that process. This is a singular fact, and becomes more surprising when it is stated, that seeds so buried in the earth, are not entirely secluded from air, nor deficient in that degree of temperature necessary for germination. What the circumstances are that resist it are imperfectly known, and have never yet, that I remember, been satisfactorily assigned by any writer on the subject. *Thompson* imagines the cause to be referable to the absence of air, but this is rendered improbable since the interstices between the particles of earth, at any depth below its surface must necessarily be filled either with air or water. At a certain depth the diminution of temperature would be fully adequate to explain the difficulty. Perhaps the compression of the seed by the weight of incumbent earth, may also be one cause, as we know from some experiments of *Sir James Hall*, that such compression is capable of preventing the extrication of an elastic gas, even when its elasticity is assisted by considerable heat: and the cause capable of preventing the extrication of a gas under such circumstances, may also prevent its formation, and if no gas be formed, no germination can take place. These facts, and observations, may furnish the agriculturist with much useful, practical information.—They suggest the propriety of examining the nature of the interior of those hills which are sometimes required to be levelled, in order to discover whether they contain the unimpaired seeds of any plants, whose cultivation it is not desirable to promote: they also serve to explain the exhaustless production of particular kinds of weeds in certain lands, and point out the most rational plan for preserving seeds, and those roots which vegetate like seeds.

We have here seen what circumstances may prevent germination, and are thereby indirectly led to a knowledge of those which will promote it.

A seed exposed to moisture, atmospheric air, or any air containing uncombined oxygen gas, or oxygen in a state of weak union, and a temperature above thirty-two of Fahrenheit, undergoes a series of changes which appear easily explicable on chemical principles, and which at the same time will explain the uses of a soil to germination. If a soil be too retentive of moisture, or be so situated as to receive too much of it, it will acquire heat with remarkable slowness, and the seeds committed to it will be almost entirely excluded from the air, and, consequently, will vegetate either with great feebleness, or that process will be completely interrupted, and a spontaneous decomposition of the seed will ensue. If too dry, germination will be irregular. But if they be placed in a well attempered soil the process will proceed with vigour. Hence it appears, that it is the combined influence of moisture, air, and heat, independent of soil, that occasions the first change in a seed.

If a seed which has been immersed for some hours in water, be surrounded by a definite quantity of confined air, it will soon be discovered that the seed has effected an alteration in such air, a portion of its oxygen having been absorbed, and united to a portion of the carbon of the seed, and a volume of carbonic acid gas emitted exactly equal in bulk to the oxygem gas consumed. This process has a very striking analogy with that of combustion, inasmuch as a combustible body is hereby changed into a product of combustion, by being saturated with oxygen gas, during which saturation, a considerable quantity of heat is extricated: the extrication of the heat may be easily ascertained, if, instead of experimenting on a few seeds, a thermometer be introduced into a heap of barley when placed on the couch of a malt house, during the process of germination.

This germination of heat, and loss of carbon, is accompanied by very important changes in the seed itself. In the cerealia, starch is the substance which composes the principal part of the seeds, and starch, when deprived of a small proportion of its carbon, is converted into a substance resembling sugar in many of its properties. Indeed it seems to consist of sugar combined with a mucilaginous matter. This change is necessary for the purposes of germination, for starch, being insoluable in water, furnishes no nutriment to aid the development of the radicle, and plumula of the seed, until it pass into the state of sugar.

It is probable that nature has provided the cotyledons of plants with starch, rather than sugar, from its being less liable to spontaneous alteration. Solubility is an essential property of all substances that assist vegetation, and is not confined to germination only, but is equally indispensible in every after stage of vegetable life—a truth of great practical importance, and one that I shall have occasion to allude to more fully hereafter, when treating on manures.

The changes that the seed is here stated to undergo, are not only such as chemistry explains, but also such as chemistry would lead us to expect. The constituents of starch, and the proportion of them are as follows:

Carbon	43.55
Oxygen	49.68
Hydrogen	6 77

whilst those of sugar are

Carbon	42.47
Oxygen	50 63
Hydrogen	6.9

hence it is obvious, that the abstraction of a small portion of the carbon from the former will leave a substance not only composed of the same constituents, but in nearly the same proportions as they exist in the latter; and what is effected here by germination, may be produced by other processes in the laboratory of the chemist, as was first proved by *Kirchoff*, and has since been repeatedly confirmed by numerous experimentalists. The small excess of oxygen and hydrogen contained in the sugar may be readily explained, according to the commonly received doctrine of chemists, namely, that water is a body composed of those two constituents, for the proportion of those excesses is almost precisely such as to form water; and, consequently, the combination of a quantity of water with the starch equal to both, would furnish, agreeably to that theory, the elementary deficiencies.

I have here stated, that the constituents of the seed have undergone such a change in their proportions as to produce a soluble out of an insoluble compound, and that this change has been effected, principally, by the agency of oxygen gas, through the medium of water. That the result is to be ascribed to the oxygen gas, is demonstrable by a very simple, and yet decisive experiment. If seeds, instead of being moistened with common water, be immersed for a short time in water impregnated with oxymuriatic acid gas, such seeds will germinate much faster than before; and to this practice recourse is sometimes had in order to make delicate, exotic seeds germinate, which refuse to do so in this climate under common circumstances. The reason of this is obvious; oxygen gas is presented to the seed in a condition better fitted for combining with its carbon than that which it possesses in atmospherical air.

As moisture, oxygen gas, and heat are favorable to germination, so light is unfavorable to it. This arises from certain rays which form part of solar light; those rays have been called, from the property they possess, deoxydizing, and, consequently, as the name imports, they have a tendency to prevent the combination of oxygen with other substances, and, therefore must resist that disposition to union, which is necessary in germination. Hence the reason why seeds require to be covered by the soil, and why the process of malting is conducted most rapidly in the dark; and hence, probably, the reason why the sun's ray extinguishes fire.

Although light acts unfavourably to the germination of the seed, yet, when the plant is formed, it becomes a powerful agent in assisting its growth, so much so, that without light it is reasonable to infer, that not a single tree could arrive at maturity; and without light flowers would be destitute of colorific beauty, their grateful aroma would be lost, and their inflammability destroyed. Hitherto I have considered the progress of germination no farther than the changes which are produced in the constituents of the seed, but, if we carry our examination a little further, we shall see that the immediate consequence of such change, is the extension of the plumula and radicle, the former of which is designed to become the stamen of the plant; the pillar to sustain its branches, leaves and organs of fructification; the latter to derive nourishment for the plant, from substances contained in the soil. Here chemistry ceases to afford explanation. Here philosophy is bewildered, and is constrained to acknowledge its researches unsatisfactory. Why the presence of a moderately warm solution of sugar within a seed, should occasion two portions of matter, hitherto apparently inert, to prepare themselves to perform such important, and unexpected offices, can be explained by no principle with which we are at present acquainted; and the wonder becomes still greater when we find the chambers in which the food has been stored, converted into two leaves, the plumula acquiring colour, and sending out shoots; and finally producing flowers, and fruits; the most exquisite, and useful objects of the creation.

To explain the manner in which organized matter is generated, is one of the most difficult, and interesting inquiries of philosophy. When glands are once formed in the human system, and secreting vessels analogous to them in vegetables, we are greatly assisted in forming our notions concerning the production of particular fluids, and solids; and the evolution of matter constituting growth; but the formation of those glands, and vessels, is scarcely explicable, except on the hypothesis, that other glands, and vessels have previously existed to produce them; and thus we are merely carried back in our researches, without advancing one step nearer to an elucidation of the difficulty.

Although we are not in possession of any means of knowing by what processes organization is effected, yet, by diligent observation, we may discover the order in which particular parts are formed, and become acquainted with the substances for whose production they appear to have been specifically designed. All knowledge is useful, and this is particularly so, for, by ascertaining the time when any substance begins to be evolved, we learn the moment that assisting means should be employed to aid its evolution. This may be exemplified in wheat. During its growth there appears to be formed nothing but vegetable matter, or matter composed of oxygen, hydrogen, and carbon, mixed with, perhaps, a minute portion of carbonate of lime: but, when the grain is to be formed, there is taken up a considerable quantity of either pure nitrogen, or some substance containing that element, and also a notable portion of phosphate of lime. It is rendered highly probable that the nitrogen is taken up in some soluble animal matter, most of which have the remarkable, and anomalous property of dissolving phospate of lime; thus ministering to the plant not only by its own elements, but, also, as the vehicle of another useful, and perhaps, necessary constituent—a constituent which could not have been furnished by any other known medium.

The above remarks are not confined to wheat; almost every plant, at the time of fructification, secretes substances, and forms compounds peculiar to that stage of vegetation.—Whether new organs be framed for that especial purpose has not been determined, for, I believe, it has never been considered. What a field for speculation does this open! it is an untrodden path in the wide, and delightful regions of vegetable physiology. And, although the laws conspiring to evolve these secreting organs, may for ever remain inscrutable to human research, yet to know that such secretions do take place, and that such laws do exist, will furnish the practical Agriculturist with much useful information. It will teach him that the same manure which formed the stamen and leaves of a plant, may not be able to form the seeds, and, consequently, will direct him to provide it with such substances as are calculated for that purpose. On this point I shall have occasion to dwell in the sequel of this Essay.

(To be Continued.)

OF WINTER FALLOWING.

Altamont, July 1, 1816.

Dear Sir—I beg leave to direct the attention of the Society, to an object I have long thought of the first importance, and my observations during the last two years have so strongly convinced me of its great utility on our ridge farms, which are generally stiff clay lands, that I flatter myself the Society may think the subject worthy of their consideration. It is a winter fallow.

The modern improvements in husbandry have, I believe, entirely superceded the old laborious and expensive mode of cleaning lands by summer fallow. Fallow crops have been introduced which have the desired effect, and at the same time preserve the soils from losing their finer and more subtle particles by evaporation, while they yield some return to the farmer for his labor. Still however, the principal object of a fallow crop is cleaning foul land, and if great judgment and care is not exercised in the selection and culture of the crop, the soil will be as much exhausted as by the old naked fallows. But the winter fallow has a higher object; its direct tendency is the actual improvement of the soil, by exposing it to the action of the winter rains and frosts, which perhaps more minutely enter, separate, and pulverize our stiff clays, than any other known agent. The action of frost however, is generally limited to an inch or two below the surface, but by throwing our stiff clay fields into five or six feet ridges, high on the crown, and the furrows made very deep, we admit this friendly agent to as great a depth as is necessary for most of our crops. In this stage of the fallow, if manure of any kind can be procured, there is no mode of application more economical, or more immediately useful, than scattering it in the bottom of the deep furrows. In March the ridges are to be split down and gathered over the manure. Thus, every particle of the soil

will be moved, and the frost, the manure, and the plough will have totally destroyed that compact adhesion which is the unfortunate characteristic of our clay soils. Corn may then be planted from three to five or six feet distance on the ridges, according to the quantity of manure or quality of the land, with the greatest probability of a successful crop.—From my own experience, I can affirm, that stiff clay worn soils have produced three times as much as they did, without the winter fallow and manure, and nearly twice as much, *with* winter fallow, and *without* manure, as they did without either.

I may be told, however, that manure alone, without the fallow, would be sufficient to produce this difference, and the labor of one ploughing be therefore saved; but a strong proof of the necessity of the fallow fell under my observation a week or two ago; so strong indeed as to have influenced my decision, to address this communication to you.

My neighbor had ridged up a field in *March last*, the ridges twelve feet apart, manure was spread in the furrows, and the ridges gathered over the manure. I was convinced there was manure enough, as the roots of some stalks of corn, that had been thinned out, brought up large balls of manure, as they were pulled up This field was planted the third and fourth days of April, and the corn appeared to be generally about three feet high, and looked indeed well, but not of that flourishing vigorous growth, I had expected from its culture and the great width of the rows. A stiff field of mine, had been winter fallowed in the mode I have mentioned, the last of *November*. The manure was hauled out and spread in the furrows, the middle of March, the ridges were reversed, and corn was planted four feet apart, the last day of March, three or four days only sooner than my neighbor's; and it did appear to his manager and myself, that my corn was twice as high, of a deeper color, and generally more vigorous and luxuriant; yet their treatment was similar; their culture equal; his land naturally better than mine, his rows twice the width, but his field laid hard and compact, under the frost and snow of the last winter, being only ridged in March, while mine was ridged in November last, and exposed during a hard winter to the full influence of the frost and snow. This case appears to me decisive of the great advantag. of a winter fallow.

A proof of the utility of this operation is, that for several months after forming the new ridge in the spring, the soil of it continues to be mellow and loose, affording fine pasturage for the roots of plants, and although a plough is never to run across the ridges, so as to displace the manure or destroy the young roots; yet they are so open and mellow, that your walking stick may easily be pushed down to the bottom of the winter furrow. It is self-evident that this must be greatly advantageous, and consequently the plant arrives *sooner* at perfection, as its growth is never retarded by the struggles of the young roots to penetrate a stiff soil. I remarked last summer, that the fodder and corn were taken ten days or a fortnight sooner from the part of the field that had been winter-fallowed and manured than from other corn planted at the same time, and one acre of the fodder of the former was worth that of any two acres which had not been so treated.

Among the numerous incidental advantages of this practice may be also stated, that of destroying most of the weeds by turning them up to be killed by the frost, and their decay assists to enrich the soil. I should think it strange indeed if our fields were not clean, when the weeds are so incessantly attacked by the frosts, of the winter and the ploughings of the summer, in this mode of culture.

But again, I may be told that even gold may be bought too dear, and that this operation in husbandry, though beneficial, will not pay by its surplus product for the surplus labour it requires. As this is an objection which may at first appear reasonable, and which, if well founded, would of course render the practice of winter fallowing ineligible, I will very briefly examine it.

I presume that I am correct in stating the value of the labor of a man with his horse and plough at one dollar a day. Let us suppose we have a field of stiff red clay of ten acres, and that by industry and judgment, it will produce in the common way, ten bushels to the acre.—The only difference in the labour and expense of culture of the two modes, is the ridging up in the beginning of winter in the practice of winter fallowing For the reversing of the ridges in spring, is not more expensive than the common mode of preparing a field properly for planting. I know that an acre a day is light work for one plough, the expense therefore of ridging up the field is ten dollars, and I really believe all other expense and trouble to be equal in both modes. The produce of the field in the common mode is one hundred bushels, and I can hardly prevail on myself to state the produce of the winter fallowed field so low as fifteen bushels per acre; I feel well assured from one years experience that it is double that of the common mode, but even at one half more, its produce is one hundred and fifty bushels, which additional fifty bushels you get for ten dollars. To this is to be added, that your fodder in quality and quantity is superior in the same proportion, and if you have peas in the step on the ridge, their produce also excels that of the common mode; in a word, your crop is one half better in all respects. It will be remembered too, that your winter fallowing can be done in a season of leisure, and that your soil is improved by pulverization and the destruction o. weeds.

If these are facts, sir, which I have stated, and I have myself no doubt of their reality, they are worthy of consideration; and with a sincere hope that they may be beneficial to those of my brother farmers, who have stiff clay soils.

I remain very respectfully,
Your obedient humble servant,
THOS. PINCKNEY, Jr.

J. T. Lewis, Esq. *Corres. Sec'ry. of the Pendleton Farmers Society, South Carolina.*

CULTURE, PRODUCE AND EXCELLENCE OF

MANGEL-WURTZEL.

TO THE COMMITTEE OF THE MASSACHUSETTS AGRICULTURAL SOCIETY, ON AGRICULTURAL EXPERIMENTS.

Jamaica Plain, 20th Nov. 1820.

Gentlemen,

Having the last year addressed a note to the Secretary of the Society on the subject of the culture of *Mangel Wurtzel*, of which vegetable I had just been raising a small patch—and from the high opinion I therein expressed of its value, I thought it my duty to attempt its cultivation this year on a larger scale, having procured fresh seed from Holland. I now beg leave to give you the result.

The land used for the purpose had been for four years chiefly cultivated with carrots—is a deep light loam on a dry gravel bottom,—and on the same spot are upwards of fifty apple and pear trees, of 10 to 15 years old. This year about 24 ox-cart loads of compost manure were used; on part of the land it was spread and ploughed in, and on part it was put in the furrow under the seed—the whole was thrown into ridges with the double mould board plough, about two and a half feet apart, then flatted a little, and the seed put in, with the fingers, at six inches apart. They were afterwards thinned to a single plant, and after they had attained considerable size, every other one was taken up and used as food for my hogs, being boiled. They were hilled with the double mould board plough, and hoed alternately three or four times during the season.

I am well convinced the whole labour on them was fully paid by the trimmings and thinnings, which my people all estimated, including those pulled within six weeks of harvesting, at not less than one hundred and fifty bushels of roots.

In the month of July the season was so dry, I feared I should almost lose my crop by drought. I think a soil naturally more moist would have been better for them. I am, however, well satisfied with the result. On the 12th of October we commenced taking them up, first cutting the tops and carting them off to the oxen and cows, the roots were then pulled, and on the 14th the whole were housed or pitted at an expense of less than ten days work on 504 baskets—24 of which I myself weighed, the average of which was 75 21-25 lb. net—and calculating, by the societies rule of 56 lb. per bushel the produce *then gathered* was 682 bushels from 1 acre and 2 roods, as appears by the surveyor's certificate, herewith handed. There being no hay-scales within three miles and not wishing to market any of these roots, I thought the trouble too much to send them, and presumed the Committee would be satisfied with the weight as above expressed.

It must be observed that allowing 10 days labour in harvesting, each man must have got in 68 bushels in one day's work, four times as much as that of harvesting potatoes. All sorts of stock are fond of them, much more so than of *Ruta Baga*, and they are I think, a more certain crop, having fewer enemies to encounter. They are not however, so easy to keep through the winter. I last year kept (in a pit) in the field those intended for seed, which did remarkably well,—and this year I have pitted 200 bushels, by digging a trench 3½ feet wide and about 1 foot deep, putting a layer of straw on the bottom and piling them about 3 feet high, and covering them with straw five or six inches deep, and then covered 6 or 8 inches with the soil taken from the trench—observing not to cover them too thick, till the weather becomes quite cold.

On three square rods of the above ground an average of 1800 bushels per acre was produced. The seed was planted the 28th of April.

I am, very respectfully, yours,
JOHN PRINCE.

N. B. I have this fall procured a double mould board plough and horse-hoe with circular cutters—the mould board and hoes are expanding, and can be worked in rows of any width from 18 inches to 3 feet apart, with this implement, in a free easy soil, I think the *hand hoe* will not be much required.

Roxbury, Nov. 20th 1820.

I Mather Withington, of Dorchester, a sworn surveyor, having been requested therefor by John Prince, Esq. of said Roxbury, hereby certify, that I have this day surveyed a piece of ground on which, as had been stated by him, a crop of Mangel Wurtzel had recently been taken, and find it to measure one acre and two rods. I also found on the said ground forty-nine pear and apple trees, from ten to twenty feet in height—also within one foot, on the eastern border, eighteen other trees, of apple and pear, of like height.

MATHER WITHINGTON, *Surveyor.*

Roxbury, Nov. 28th 1820.

We the subscribers hereby certify and declare, that we have worked on the farm of John Prince, Esq. during the whole of the past summer, that we have assisted in cultivating a piece of ground with Mangel Wurtzel, that we have seen the statement made by Mr. Prince of the culture thereof and the produce, and that so far as relates to the labour of *this year*, the manure, the produce and weight of the same, we can attest to the accuracy thereof.

EPHRAIM DOWNES.
LEONARD NEWTON.

Norfolk, ss. Roxbury Nov. 28th, 1820. Then the above named Ephraim and Leonard Newton appeared, and solemnly swore to the truth of the above by them signed Before me,

JOHN PARKER. *Justice of the Peace.*

For the American Farmer.

Agricultural Schools.

Should they not be established by the several States?

Sir,

Through the medium of the Intelligencer, I have for some time been much interested in the progress of the Maryland Agricultural Society, and as I am desirous of becoming more intimately acquainted with the proceedings of your Society by reading the American Farmer, I wish you to send it to me. The immediate, and I hope zealous, supporters of your valuable paper will doubtless appreciate the undertaking of a reform in agriculture as a patriotic duty, as well as a noble and most agreeable amusement. It is encouraging to see a spirit increasing and pervading our communities exciting our fellow citizens who have been formely engaged in careless and excessive cultivation, and in the almost exclusive attention to some one staple—now to turn their attention to many valuable crops and to the improvement of their lands and stock generally. The opportunities afforded by the wealthy and public spirited gentlemen about Baltimore to introduce foreign stock, seed, and improved implements of husbandry, I trust will be prosecuted with a zeal and steadiness commensurate with the great objects which they have in view; and when the beneficial effects of such enterprises shall be felt and acknowledged particularly by the agricultural community. their authors will be amply remunerated for their advances, and above all, enjoy the sentiment of having procured for their country advantages so substantial. And you Sir, feeling, a just national pride in being the organ of their usefulness, will be supported I sincerely hope, in a devoted attention to these great objects not merely by your own zeal, but by the substantial co operation of their advocates, who indeed ought to feel themselves under obligations to any fellow citizen, who will use every exertion in his power, to collect and disseminate the most useful theoretic and practical information in agricultural science. I have been a farmer for these 16 years and have but lately discovered my ignorance of the business, an evident proof of which is, that my soil is but little better now than when I first commenced; but still I do not know that I am a much worse farmer than my neighbours; nor do I think that farmers in general can adduce in proof of their knowledge of the profession, any considerable improvement of their soil during the past 10, 15 or 20 years. Under present circumstances it is a difficult task to impress on the minds of many agriculturists the necessary connexion of theory with practical agriculture, and the consequent advantages of scientific aid.

I would therefore most respectfully inquire of those who are better qualified to judge than myself whether the establishment of institutions, for the purpose of teaching the art of Agriculture scientifically as well as practically, would not be of great advantage to the community. I should indeed be pleased if some of your able correspondents, who I perceive are scattered far and wide over our happy country, would inquire into the expediency of our state Legislatures establishing schools in each state, to teach the Philosophy united with the practices of Agriculture—I mean in short, that several hundred acres of land should be placed under the superintendance of a well informed practical farmer; who would lead our youth into the fields to learn and to perform every variety of labour that could be useful to them in their future profession; and that on each of these farms there should also be a professor to lecture upon proper subjects, and attend to the completion of the best English education.

Can it be doubted that if each subdivision of a state could be furnished with at least one farmer who perfectly understood his employment, and who would of course be looked upon as a guide and pattern, that its agriculture would in a short time be much improved? would it not save many beautiful estates from destruction, and many amiable families from want, or the necessity of removing to a wilderness country? If it should be replied that diligence, good ploughing, and generous manuring, will insure success in agriculture; let it be remarked that a curiosity so natural to the humam mind to develope the most rational theories would be a most powerful stimulus, to industry, enterprise, and experiment. To illustrate the importance of science to the art of husbandry I will speak of a farmer, of this county whose education has enabled him not only to enjoy all the advantages common to his neighbours, but in the use of them to be governed by a chymical knowledge of his soils, and manures, and a mathematical knowledge of the implements, and force which he employs. Order being one of the first Laws of Nature, it is his anxious study to carry into harmonious practice those rules which have been instituted for the benefit, and placed within the reach of Man. His leisure hours have been employed in reading, examining, calculating, reflecting and deliberating upon the most advantageous modes of performing even the minutia of his business. From the theory and experience of others, he is seen to adopt whatsoever may be justly applicable to his own situation. And he is ever ready to give you a satisfactory reason for any part of his practice. He would not exceed one seventh of his cleared land exclusive of his meadows, in corn cultivation, nor put more than two sevenths in small grain; for the rest, he thinks, should be reposing under grass, fattening fine cattle, or yielding immense burdens of hay, soon to be returned with profit to the soil; I believe that I am correct when I state that he is in the habit of making from 80 to 140 tons of the best clover and timothy hay, annually, in addition to his other crops; although his farm contains but 250 to 300 acres of cleared land, of which he retains large pastures for his stock.

In his Domestic Animals, he is careful to unite the advantages of health, size and profit. And upon no occasion does he ever forget to increase the manure Bank, which he justly considers the fundamental source of agricultural gain.

It would, however, be too tedious to go through an enumeration of the many comforts, conveniences and advantages which result from the application of principles by his talents in the art of husbandry. Suffice it to say, that, he has accumulated wealth whilst his soil has been rapidly improved, and that he has accomplished these objects with much less labour, trouble and capital than usual; considerations truly worthy of the attention of every Farmer. I have snatched a few moments from the plough, to give you these desultory remarks, and if they should have the effect of exciting further inquiry on the subject of which they chiefly treat, I shall not lament my having accepted your invitation to the plainest farmers to contribute their mite to the cause of agriculture.

Washington, the best of patriots, the wisest of Legislators, earnestly recommended, during the last session that he ever met our Congress, the establishment of "a National Institution which should grow up under the patronage of the public and be devoted to the improvement of Agriculture." On this subject he also kept up a correspondence with the most scientific men in Europe. We revere his virtues and shall we not also profit by his wise suggestions?

Respectfully yours,

RICHARD K. MEADE.

Frederick County, (Va.) April 14, 1821.

For the American Farmer.

SOILS,

Should be improved by sowing various and many GRASSES, *and pasturing* SHEEP.

Various modes have been suggested to improve the soil, and men may be found who have spent much time and vast sums of money, to little purpose, in trying to enrich their lands by injudicious means; and although the use of clover and plaster are now generally allowed to benefit the soil more easily than any other mode of Farming, at present in use in the United States, and although I by no means intend to disapprove of this mode of improvement, yet, I am inclined to think that it will not always answer the purpose so fully as it now does:—being convinced, as I am that almost all kinds of land will tire of red clover after a few repetitions, and will not produce a sufficient quantity of it to answer our purposes, unless a considerable period of time intervenes between the crops. This I well know is the case in England, and from every observation which I have been able to make during a residence of five years in the United States, a number of good farmers are here now contending with the same difficulties, who attribute them to unfavorable seasons, and the like. I therefore wish to call the attention of your readers to the subject, and should the opinion now stated be thought correct, I would suggest that similar means be used to improve the soil, by the American Farmer, to those in regular use in England; which have been found to answer there remarkably well on almost all kinds of land, namely, to occasionally sow other grasses as substitutes for red clover, such as Pacey Grass, rough stalked meadow Grass, meadow Cat's-tail and white clover, all of which I now have growing luxuriantly upon a soil remarkably dry and formerly barren. Other grasses might also be used, I think to advantage, such as Burnet, Cinquefoil, Trefoil, Parsley, Yarrow, and several others; these various grasses should all be mixed together, and sown very thick on the soil, with fall grain in August or September, and the produce be regularly stocked with a large flock of sheep for three years, and then the land might be ploughed for culture, and afterwards put into red clover beneficially. A large flock of sheep might by these means be kept in any of the southern States, where the farms are large, and where corn is raised in large quantities the sheep would winter on the stalks and tops; or if a still house could be had to furnish the sheep with pot-ale in winter, they would do well with that and straw, and make much good manure, and pay more money when properly managed

than any other stock that could be put on a farm. And should any gentleman of large landed property, be inclined to try this mode of grazing, the writer of this letter would have great pleasure to become acquainted with him, as he has kept a number of sheep for two years in this way, and intends shortly to settle either in some healthy place in Virginia, or near Washington city, with a view to pursue this kind of employment; for he wishes to have no other care than to take charge of a still-house and a large flock of sheep. The stock that he will take with him are of the Dishley breed, from a ram imported from England only three years since. ALBION.

Chambersburg, Pa. 10th May, 1821.

For the American Farmer.

MARL.

SIR,

I beg leave to hazard an opinion that some parts of Anne Arundel County, contain an abundance of *Shell Marl*, which if sought for judiciously along the creeks and rivers making into the Chesapeake, might be obtained in vast quantities, and prove to be as valuable a manure as that found in Talbot county, on the Eastern Shore of Maryland.

If the enterprising gentlemen who have been making the most laudable researches in the neighbourhood of the Rising-Sun Tavern, on the post road leading from Baltimore to Annapolis, after that truly useful and valuable article among the comforts of life, *Stone-Coal*, would only use their boring machine for the benefit of the farmer a little lower down the road towards the farm belonging to Brice Worthington, Esquire, formerly Col. Maynadier's, and along the vallies on the east side of the road running to the Severn River, I believe that large quantities of marl would be found. This supposition of mine is warranted and strengthened by streaks of white, blue and dark brown clay, intermixed with a great variety of petrifactions of different substances, but especially of the exuviæ of marine shells and by the appearance of some sand rocks, coloured with the oxide of iron, where the road is much washed and worn several feet below the surface, actually set with quantities of decayed and petrified shells.—The underpinning of many of the houses along this road is formed of red stone, completely imbedded with various kinds of shells, having no resemblance to those now to be collected along our bay shore. It has been but a very few years, since shell Marl was discovered and saved for Agricultural purposes, in some parts of New-Jersey, with great success. Other kinds of Marl will no doubt be found. I am sure that Marl will be found within 12 miles of Annapolis, and possibly all along our salt water courses by digging for it, particularly between the Patapsco and Severn Rivers. The sandy land, of this truly neglected district of Anne Arundel County, certainly requires some assistance; and no substance in my opinion would be more useful in reclaiming it, than Marl, which would bring about a complete alteration in the texture and disposition of the soil, by binding and restoring its fertilizing virtues.

But if Marl is not found conveniently, I would advise the farmers to take portions of all the different sorts of clay, and with each of these manure a piece of ground, if only ten feet square, to ascertain which variety is best calculated to improve their grounds. I mean their *Sandy Soils*, and if the experiment answers well, then to cart it on them in the same quantity as they would manure.

In corroboration of what I have noticed in travelling along the road within a few days, I have collected and send you with this communication, some specimens, which shew certain indications of the prospect of finding Marl on the Western shore of Maryland. I have no doubt but the consolidation of the several materials, such as you will discover on an examination of the specimens took place at the time of the deluge. The rocks from which they were taken are to be found, where the old road passes over one of the highest hills, between the Black Horse and Rising Sun Taverns. The appearance of these rocks is curious and deserving of notice in a philosopical point of view.

Your's Respectfully, R.

Anne Arundel County, 8th May, 1821.

For the American Farmer.

RAILWAYS, INCLINED PLANES, &c.

SIR—"*Ecce iterum Crispinus.*"—I am before you again on the subject of Roads and Railways, and have to beg your attention to the following extract from a publication well deserving notice, entitled "Rural Economy" by S. W. Johnson," of New-Brunswick, (N. J.)

I am sir, yours, &c.

A CAMDONIAN.

South Carolina, April 1st, 1821.

Iron Roads, or Railways and inclined Planes.

"Iron Roads, or Railways are used with the greatest success in many places; they nearly answer the purpose of canals and are frequently called Dry Canals. As a particular description of one at Alloa in Scotland is given, it will be here copied.

The sleepers are 18 inches broad, and over which a rail of four inches square is pinned down to them by oak pins—over this another of the same dimensions is laid; care being taken to cross the joints of the lower one, the whole is well beaten up in good clay; on the top of the uppermost rail, is a bar of maleable iron of one inch and a half in breadth, and upwards of five eights of an inch in thickness, upon which the wheels run. A wagon carries a ton and a half of coals, besides nearly three tons of carriage." "Cast iron wheels would be a great saving. There is a real road of this kind near Manchester, the expense of which amounted to only 1332 dollars per mile; on this road *a single horse will draw seven wagons*, EACH *loaded with seven hundred weight of marl.*

"Mr. Holt of Liverpool, observes these roads should be double, or two distinct roads, laid at a small distance from each other, with intersecting branches, so as to admit carriages to pass different ways, and pass each other at pleasure."

Mr. J. then proposes objections that may be made to the plan; and, obviates them. He well observes that,

"Roads and rivers are the veins and arterie of Agriculture and Commerce; through thes the blood flows that keep both alive, and shews a country in health and prosperity; and when these are clogged, agriculture is laborious and unproductive; manufactories are reared with difficulty from domestic infantine weakness into national importance; commerce moves heavily along and an appearance of apathy is the leading feature of the community.

However, it may be presumed, under the advice of their Engineer, Hamilton Fulton, Esq. the North Carolina Board of Works have ordered some attention to be paid to the positive and comparative advantages of the Railway system; and I trust the result will be such as to ensure its travelling farther southward.

For the American Farmer.

CULTURE OF CANTELOPES.

SIR, *Baltimore County.*

On the first day of May, plant some corn, and when you see that up, plant your cantelopes. It is very material to hit the right time; if too soon, your plants will come up and be eaten by bugs, who claim all plants that do not grow from their birth—choose a piece of ground new and clear of trees and shrubbary—plough it well, make trenches one foot deep, 10 feet apart—fill the trenches level full of good manure; cow, horse, or hog. It is not necessary that it should be very old, or very nice—then rake up a ridge of fine earth, six inches high and two feet broad, and plant the seed, one or two every four inches, in the centre over the dung. If you have no fine, rich earth for this purpose, I advise you to burn a parcel of corn stalks, and litter on the ridge. When the ground bakes, plough between the ridges, and repeat it till the cantelopes are as big as English walnuts. To do this, it is necessary to keep the vines on the ridges—they should never be turned over—they should be pruned at the first runner. When they have received their last ploughing, which is all essential, then encourage them to run over the ploughed ground. Insects will thin your vines for you, but if they do not, one vine may stand every three feet. When ripe, they will look a little bilious and may be indented with the finger; they are then to be put into a hearth from 12 to 24 hours to get fully ripe—most people understand the rest very well. You will see by the fruit from the seed which I send you, if you are successful, how erroneous the idea is of their degenerating. I have had some of these seed 15 years, or more; and the others have been that long in the country.

J. S. Skinner, Esq. S. V. S.

TO THE EDITOR OF THE AMERICAN FARMER.

GREAT CROP OF CORN.

Talbot County, Maryland,
APRIL, 1821.

SIR,—In your paper No. 1, volume 3, you have stated that a Mr. Rose, of Pennsylvania, last year made of Indian corn, at the rate of 136 bushels per acre. I nearly equalled it the same year, having made from one acre, 131 bushels

7 gallons and 1 quart of shelled corn, good and sound—in barrels, I made 22½. The corn was planted about the 15th of May, and gathered in the first of December last, *after the ground was sown in wheat*, by which I, no doubt, lost considerably in corn.

This crop was so extraordinary that I had hesitated about informing you, (although it was published in the Easton Gazette) until I saw that it was exceeded in Pennsylvania. If you think that some notice of this crop will have a tendency to retrieve the character of the Eastern Shore from the charge of sterility, you are at liberty to mention it.

At this moment, I have not time to inform you as to the process of cultivation, but I will be happy at some other time to mention it, particularly if you wish me to do so.*

THOMAS P. BENNET.

* This information will be thankfully received.

[EDITOR.

PACKING OF HAY.

Mr. SKINNER,

Some of your enterprising and intelligent New-England correspondents, acquainted with the business, would doubtless confer a favour on many of their brother farmers, residing near the waters of our noble Chesapeake, and its tributary streams, by making known, through the medium of your useful paper, the most simple, expeditious and economical method practised among them, of packing hay for distant transportation. I have been credibly informed that the packed hay of the eastern states finds a market even so high up the Mississippi as Natchez; and no doubt much more of that valuable article would reach your city, were the farmers of this part of the country, who have it to dispose of, acquainted with an easy and not too expensive manner of sending it thither. Your attention thereto will oblige a farmer, and

ENQUIRER.

QUEENS TOWN, MARYLAND
April 18th, 1821.

BUTTER *made quickly by freezing* MILK.

Salem, (Mass.) May 7th, 1821.

SIR,—By the aid of frost, I find it much easier to convert milk into butter in the winter, than by any process whatever during the summer season. The milk when taken from the cow, is immediately strained into earthen pans and set in the coldest part of the house—as soon as the frost begins to operate, a separation takes place; the cream rises in a thick paste to the top, and leaves the milk without a particle of the cream, frozen in the pan. The cream is not so hard but that it can be easily scraped off with a spoon, down to the solid ice. It is then set aside until a sufficient quantity is collected for churning, when it is warmed just so much as to thaw the cream sufficiently to put it into the churn. I have never known it to require more than five minutes to convert such cream into butter, after the churning had commenced.

All the butter consumed in my family the last winter has been made in this way, and I think I never had finer. I ought to state that I think this method injurious to the cream for certain purposes, such, for instance, as whip-syllabub, as my domestics found, after the cream was mixed with the other ingredients, the least agitation brought it into butter. Any assistance that I can give you from this section of the country, will be furnished with pleasure, by your friend & servant.

E. HERSEY DERBY.

J. S. Skinner.

MANAGEMENT OF CALVES.

SUCCESSFUL EXPERIMENT OF REARING CALVES WITHOUT MILK—FROM THE TRANSACTIONS OF THE BATH SOCIETY, VOL. 5TH.

TYTHERTON, Dec. 3, 1789.

Sir,

The following is as near a calculation of the expenses of rearing my calves without milk, as I can at present assert. In the year 1787, I weaned 17 calves; in 1788, 23; and 1789, 15.

I bought in 1787, three sacks of linseed; I put one quart of the seed to six quarts of water, which by boiling ten minutes became a good jelly; this jelly is mixed with a small quantity of the tea of the best hay, steeped in boiling water.

Having my calves to drop at different times, I did not make an exact calculation of the expense of this hay tea; but out of my three sacks of seed, I had better than two bushels left at last. I gave them the jelly and hay tea three times a day. To the boy who looked after them, 6d.* per day—the price of my linseed was 4s. 6d.† The whole three years seed, two pounds five shillings.‡ My calves are kept in good growing state, and are much better at this time than those of my neighbours, that are reared by milk—they do not fall off so much when they come to grass.

I am, &c.

TH. CROOK.

* 11 cents. † 1 dollar. ‡ 10 dollars.

An easy method of curing Warts.

It is thus—Take an apple and cut it, and rub it for a few minutes over the wart, the juice of the apple will loosen the root of the wart, which will, in a few days drop off.

THE FARMER.

BALTIMORE, FRIDAY, MAY 18, 1821.

PRICES CURRENT.

Flour, from the wagons, $3 87½ a 4—*Whiskey*, from do 24 cents per gallon—*Hay*, per ton $19—*Straw*, 7 to $8—Wheat, White 80 to 82 cts—Red, do 73 a 76—*Corn*, white 32—yellow 34 cts.—*Oats*, 23 a 25—*Rye*, 35 a 37—*Barley*, 25 to 30 per bushel—*Cod Fish*, per quintal, wholesale $3, retail ditto $4—New-England *Beans* per bushel, $1 12½—ditto *Peas*, 75 cents—*Plaster* in stone $6 per ton—do. ground, $1 35 per barrel, 33 cents per bushel, $8 per ton—New Orleans *Sugar* $7 50 to 10—Muscovado, do. $7 50 to 9 25—American *White Lead*, $12 50—Ground, do. $13 a 14—*Linseed Oil*, 75 cts—*Feathers*, 40 to 45 cts—*Potatoes*, per bushel, 62½ to 75 cts—*Shad*, new, $6—*Herrings*, $2 to 2 25, declining—Fine *Salt*, 45 per 100 bushels—Ground Alum do. 46 to 48—St. Ubes, 50—Cadiz, 38 to 40—retail do.—Turks' Island, 75—Cadiz ditto, 60—Live *Cattle*, 5 to $5 50—*Beef*, *Mutton*, 8 to 10 cts—*Hams*, 10 to 12 cts—*Middlings*,—to 10 cts—*Butter*, 20 to 25 cts—*Eggs*, 12½ cts. *Cheese* 8 to 10 cts. pr lb.—*Tar*, $1 50—*Turpentine*, $1 87½ to 28, *Pitch*, $2½; *Rosin*, common 1¾, bright do. $3 per barrel,—*Varnish*, 25 cts—*Spirits turpentine*, 33 cts per gal.—*Cotton*, good Upland, 13 a 15 cts. very dull—*Rice*, 3 a 3½ cts.—ship and flooring *Plank*, $25 to 27 *Shingles*, best 6½, to $7, com. $3 to 4½ p. M.—*Oak* wood, $3 50, *Hickory*, $5 per cord—*Clover* seed $6—Am. *Orchard*, grass do. $4—Eng. do. do. or *Cocksfoot* do. $8,—*Herds* do $3—*Sanfoin*, per bushel $8—*Millet*, do. $2—*Lucern*, 62 cents per lb—*Sweet Scented Vernal* grass, 150 cents—*Trefoil*, 50 cents per pound—*Ruta Baga*, 50 cents—*Mangle Wurtzel*, 175 cents per pound—*Cabbage* seed 2 to 6 dolls. per pound—*Cauliflower*, 75 to 100 cts. per oz.—spring *Tares*, 8 per bushel—*Peas*, 25 to 37½ cts per quart—short orange *Carrot*, 12½ cts.—*Parsnip*, 12½ cts—*Lettuce*, 25 cents—*Raddish*, 12½ to 20 cts—*Beet* 20 cents—*Brocoli*, 31 to 100 cts.—*Cucumber*, 37 to 50 cts per oz.—*Turnip* seed, 50 to 125 cts per lb.—*Chicory*, 75 cts. per per pound—*Rape*, 12½ cents do—large Amsterdam *Cabbage* for cattle, 25 cents per oz—Irish *Furz* or *Wins*, $2 per pound—Bush and Pole *Beans*, 6½ to 25 cents per quart—New York premium *Ploughs* of sizes from 7 to $16—*Box Churns*, 8 to $9—*Drill Machines*, 10 to $11—Bennet's broad cast *Machine* for sowing Clover, Turnip, and Grass Seeds, $18—*Expanding Cultivators*, $15—*Post Augurs*, 5 to $9—*Flexible Tubes*, to relieve cattle when hoven or choaked, with gags, the pair $5—*Corn Shellers*, 20 to $25—*Turnip Scoops*, 50 cents each—large 2 horse Connecticut *Ploughs*, iron mould boards, $11—do. do. wood, 10$—small *Ploughs*, do $7 50.

Tobacco—A few hhds. Richmond, new crop, good, sold the present week at 7 dollars.

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